

Open-Path Laser/Optical Communication Systems and Methods Utilizing Wavelengths Between Atmospheric and Gaseous Absorption Lines

Abstract

An open-path optical communication system has either optical or laser sources and communicates between the source and a detector. In a first embodiment, the laser source includes a gas cell in the laser cavity to regulate laser wavelengths based on the minimum absorption between spectral lines of the gas in the cell. The laser is tuned close to a minimum absorption wavelength and the minimum absorption line locks the laser wavelength to the minimum position. In a second embodiment, the strong absorption lines of a gas in a gas cell positioned at a receiver site are used to provide channel isolation of the receiver. In a third embodiment, an atmospheric gas provides the channel isolation. In the fourth embodiment, individual wavelength channels are positioned between the absorption lines of atmospheric or non-atmospheric gases to prevent cross-talk between adjacent channels.